Civil and Environmental Research
ISSN 2224-5790 (Paper) ISSN 2225-0514 (Online)
Vol.8, No.6, 2016
www.iiste.org

# Ground Water Analysis for Physical and Chemical Parameters in Chromepet Area

B. SARITHA A. AMBICA Dr. M.P. CHOCKALINGAM
Department of Civil Engineering, Bharath University, Chennai – 73, INDIA

**Abstract**
The project wa scarried out in and around Chromepet area,Chennaiwhich covers parts of MGR Nagar,Eashwari Nagar,Gokulam colony toPammal includingLeatherIndustries surrounding Tirupananthal Lake.The area serve sas a hometown for various small and large scale tanning industries along with housing areas,educational institutions and lakes. Tanning of leather mainly Chrome tanning is popularly practiced here, so the place is called 'Chrome`pet.'It is situated in the outskirts of Chennai city,TamilNadu.The location taken for study is 13km away from the Bay of Bengal. About 25 samples were collected and the physico-Chemical parameters including copper and chromium of ground water samples has been analysed. Thus this study is aimed to indicate the impact of effluent from tanning industries on the deterioration of ground water quality in this area.
**Keywords:** Physico-Chemical characteristics, Chromepet, Chromium, Copper, drinkingwater.

## INTRODUCTION

Water is very important to many sectors of the society for the survival of human.These water resources are not evenly distributed in space and time, and also they are not protected and are under threat due to undefined activities of people. The water occurs in different forms like in the air, on the surface, below the ground, and in the oceans. In Earth only 2.5 % accounts for fresh water and remaining in the form of glaciers and ice caps. Apart from these, the remaining part of freshwater is in the form of groundwater.

Development of industries has led to the problem of many types of pollution. Because of scarcity of water in many areas we are in need to preserve the available water.When population has started to increase, demand also increased. Earlier it was believed that the water bodies like oceans were very large to pollute. The word "pollution" was taken from the Latin word"pollution" meaning defilement. Defilement means making dirty.

K.Brindha,et.al studied occurrence of chromium in groundwater inAvadi area of Tamil Nadu.The impact of effluent from industries on groundwater quality in Avadi clearly indicates that 86.11% of groundwater has chromium above the permissible limits of drinking water.The overall chromium concentration beyond the desirable limits thereby making the water not portable.Annapoorna et al,studied the intrusion of seawater in coastal regions of Chennai.In about 35% of wells were beyond desirable limits.The groundwater was slightly acidic which is due to disposal of domestic and industrial waste towards Coovum River.

D.Longanathan et al,investigated groundwater of north and south Chennai revealed that the water quality was within the ISI Standard except few parameters which may be due to intrusion of sewage system into the ground water.

In India,Tamil Nadu accounts for more than 75% of leather manufacturing industries.It is located in and around Chromepet which covers parts of MGR Nagar, Eashwari Nagar, Gokulam colony to Pamma lincluding leather industries surrounding Tirupananthal Lake.This area covers tannery industries along with residential areas and lakes.

## MATERIALS AND METHODS

Sampling was carried out and a total of 25 w a t e r samplesweredirectlytakenfromwellsandborewells which has been shown in Fig.2.throughout the study area. The samplescollected were preserved in laboratory to analyse the water quality. Thesesamples were analysed for different parameters as shown in Table 2.

 

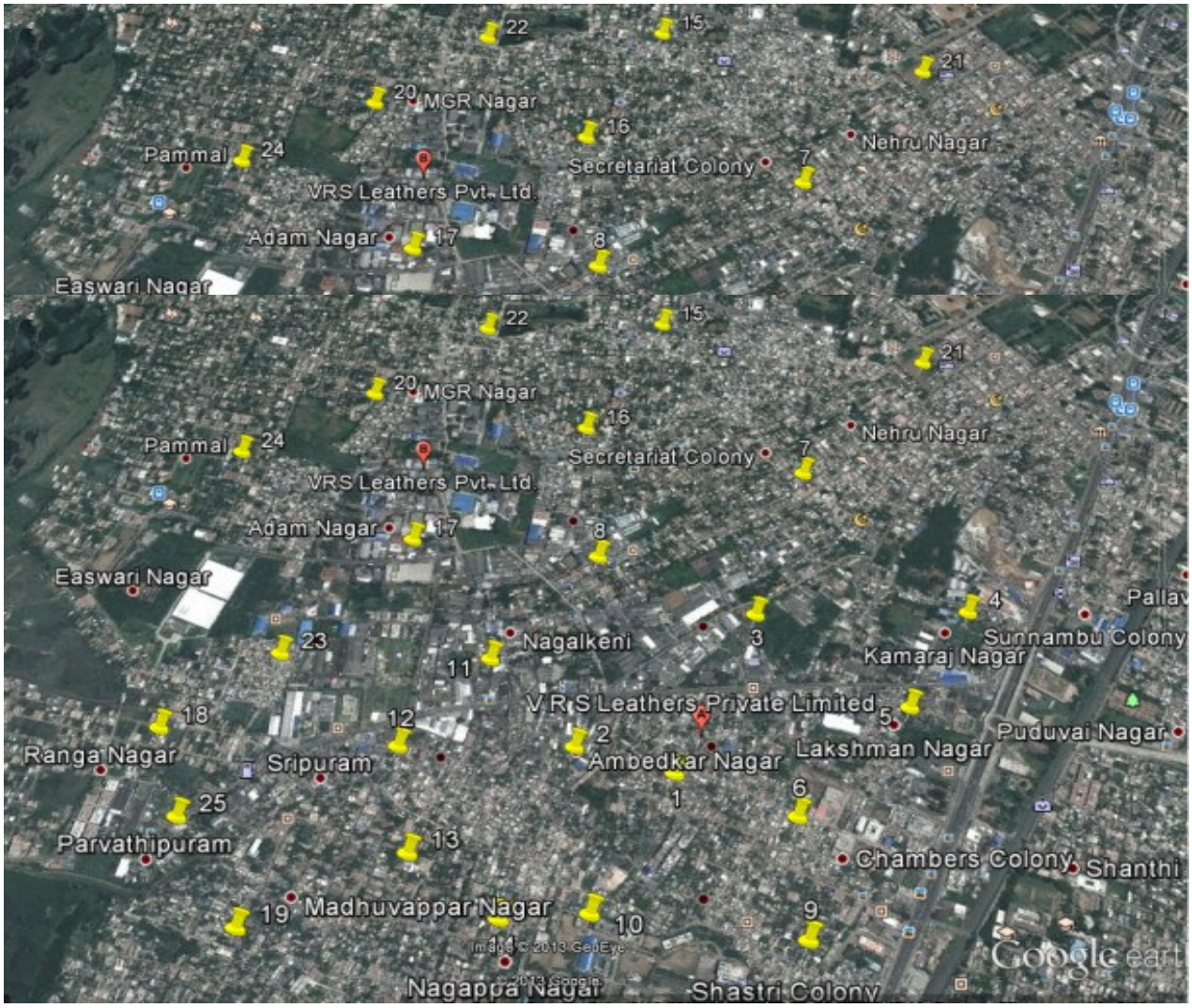


**Fig. 2 Location of samples**

## RESULTS AND DISCUSSION

The quality of groundwater in Chromepet area was studied for drinking water. The values of physico-chemical parameters are shown below in tabular column

 

**Table.1 Values of physico-chemical parameters**

| Physico-Chemical Parameters | Sample Number | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Turbidity NTU | 0 | 0 | 0.3 | 0.4 | 0 | 0 | 0.2 | 0 | 0 | 0 | 0 | 0 |
| Total dissolved solids (mg/l) | 1728 | 1500 | 2184 | 1230 | 2940 | 1420 | 1810 | 2520 | 2350 | 2016 | 1849 | 1670 |
| pH | 7.34 | 7.34 | 7.35 | 6.95 | 7.28 | 7.13 | 6.98 | 7.16 | 7.24 | 7.24 | 6.68 | 7.21 |
| Alkalinity (mg/l) | 390 | 270 | 590 | 265 | 490 | 365 | 420 | 450 | 370 | 450 | 250 | 380 |
| Chloride as Cl (mg/L) | 640 | 400 | 450 | 400 | 1150 | 780 | 900 | 900 | 700 | 600 | 400 | 600 |
| Fe (mg/L) | 0 | 0.3 | 0.2 | 0.1 | 0.1 | 0.4 | 0.1 | 0.1 | 0.3 | 0.1 | 0.3 | 0.1 |
| Total hardness (mg/L) | 630 | 580 | 800 | 360 | 810 | 470 | 590 | 750 | 575 | 630 | 390 | 490 |
| Nitrites (mg/L) | 0.5 | 0.2 | 0.1 | 0.2 | 0.2 | 0.3 | 0.4 | 0.1 | 0.2 | 0.1 | 0.3 | 0.2 |
| Copper (mg/L) | 0 | 0.13 | 0.06 | 0 | 0 | 0.1 | 0.16 | 0 | 0 | 0.11 | 0.08 | 0.1 |
| Chromium (mg/L) | 0 | 0 | 0.01 | 0 | 0 | 0.03 | 0 | 0 | 0 | 0 | 0 | 0 |

Water sample no .3,5,15,18and19 shows more contamination and sample no. 22 and 24 shows the presence of copper which indicates that the water is highly polluted since higer concentration of copper causes liver and kidney damage, gastrointestinal irritation.

The water sample no.4,11,13and22 have less hardness.Sample no.6,17and24 indicates presence of chromium which are above the desirable limit. Presence of chromium causes skin irritation, gastrointestinal effects, lung tumors, damage of nervous system, circulatory systems.The water sample no.4,11,13and25 shows very less amount of contamination level and can be used for various domestic purposes.

## CONCLUSION

Therefore the ground water at few areas in Chromepet shows high level of pollutants.And other areas show moderate pollution in the study area. Hence proper efficient remedial measures should be taken to reduce groundwater pollution levels in this area.

## REFERENCES

1. APHA : Standard methods for the examination of water andwastewater, American public health association , 19th Edition,Washington USA (1995).
2. Gunjan Bhalla, Arvind Kumar and Ajay Bansal, Asian Journal of Water, Environment and Pollution., 8(1), 41(2011).
3. Banuraman Saritha and Meikandaan T.P., Treatability study of tannery effluent by enhanced primary treatment, Int. J. Mod. Engin. Res. (IJMER), 3(1), 119-122, (2013).
4. Saritha B, Madavan V. Study of Ground Water in Perungudi Area of Chennai: Correlation with Physico-Chemical Parameters. Civil & Environ. Res. 2011;1(1):23-31.
5. Ramakrishnaiah K.M., Sadashivaiah.C. and Ranganna.G.(2009). Assessment of water quality index for the groundwaterin Tumkur Taluk, Karnataka State, India, E-Journal of Chemistry, 6(2), 23-530.
6. R.K.Trivedy, P.K. Goel; Chemical and biological methods for water pollution studies, Environmental Publications, India (1986).
7. D. Kumar and B.J. Alappat, Int. J. Environment and Pollution., 19(5), 454(2003).
8. Indian standard methods of sampling and test (Physical and Chemical) for water and wastewater.
9. Part I sampling IS 3025 (Part I) – 1987 (Reaffirmed 1998).
10. Indian Standard – Drinking Water – Specification IS 10500 – 1991 (Reaffirmed 2009).